FIRST QUARTERLY REPORT:
Using Dispersal and Environmental Variables to Predict Milfoil Occurrence and Susceptibility to Invasion by Non-Native Milfoil in New Hampshire Lakes

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Summary of First Quarter

The expected activities during the first quarter of the research project, as defined in the original proposal, fall under two phases of the project: data acquisition and data analysis. The phases of the research project follow a timeline, broken down by months (Table 1). To date, our research efforts are largely congruent with our predicted timeline. We received our first installments ($5,000 each) in mid-October. Following receipt of the first installments, we began the data acquisition phase of the project – the primary phase during the first quarter of the research (Table 1).

Table 1. Timeline as outlined in the original proposal. To date, we have almost completed the Data acquisition phase of the project and will begin the Data analysis phase on February 2, 2006 (see text for details).

Month	Phase	Description
1	Data acquisition	Receiving mandatory environmental data from DES
2	Data acquisition	Organizing environmental data for analysis
3	Data analysis	Statistical Analysis
4	Data analysis	Statistical Analysis
5	Data analysis	Statistical Analysis
6	Data analysis	Statistical Analysis
7	Data analysis	Statistical Analysis
8	Data analysis	Statistical Analysis
9	Data dissemination	Scientific presentation; manuscript preparation
10	Data dissemination	Scientific presentation; manuscript preparation
11	Data dissemination	Scientific presentation; manuscript preparation
12	Data dissemination	Scientific presentation; manuscript preparation

The data acquisition phase of the project consists of two portions: 1) purchasing and organization of the computing hardware and software required for the project, and 2) organization of the environmental data set for analysis.

We used the first installment of funds to purchase much of the necessary computer equipment and software for the project.

NH-DES provided the requested environmental data set at the onset of the project. After acquiring the necessary computer equipment, we began organizing the environmental data set for analysis. Re-organization of the environmental data set is not trivial for several reasons. First, the information for analysis needs to be extracted from several different files. For example, data for water chemistry and data for milfoil occurrences are in separate files linked through Microsoft Access. Second, the information needs to be organized in particular ways for any given analysis. Third, because different software are used in different analyses, the same information needs to be organized in different ways for different analyses. We have made considerable progress towards extracting and reorganizing the relevant data across the several files sent from NH-DES.

Our organization of the data set began during an initial, brief meeting in Ithaca, NY for two days (November 11-12). The overall goals of this initial meeting were to 1) reiterate the goals and computational approaches of the project and 2) design an action plan for organizing the database. Both goals were met during this first, brief visit. However, additional organization of the data bases is required before the data analysis phase of the project begins.

Second Quarter Goals

The primary goal of the second quarter is to analyze the environmental data (Table 1). Specifically, we will conduct analyses aimed at predicting the probability of occurrence of *Myriophyllum heterophyllum* based on the environmental conditions of lakes. If significant associations are found between environmental variables and *M. heterophyllum* occurrences, these relationships can be used to predict susceptibility of lakes to invasion by this exotic species.

Our next meeting is scheduled for February 2-5. During this meeting, we will 1) complete the organization of the data base, 2) outline the action plan for the data analysis phase, and 3) run preliminary and exploratory analyses with the organized data base. Completion of the data organization at this point primarily involves making decisions about which variables are to be included in the final data base. Similarly, outlining the action plan for the data analysis phase involves making decisions about which analyses are best suited to the particular properties of the furnished data base. For example, different analyses are required for continuous versus categorical data. Thus, final decisions about analyses are necessarily limited by the properties of the data set. Finally, the preliminary analyses will provide valuable exercises and experience for optimizing and troubleshooting particular aspects of the statistical analyses (e.g., violation of statistical assumptions, transformation of variables, statistical power, etc.).